

Effect of potassium application in forest soil on ^{137}Cs levels in plants and fungi

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Study aims at investigating the effect of single potassium application to forest soil on ^{137}Cs levels in different species of commonly occurring vascular plants and fungi. We examined whether potassium fertilizer (100 kg K ha⁻¹ has been applied in 1992) in a forest ecosystem in central Sweden affects ^{137}Cs activity concentrations in low-growing perennial shrubs, heather (*Calluna vulgaris*), lingonberry (*Vaccinium vitis-idaea*) and bilberry (*Vaccinium myrtillus*) as well as in fungal species (*Cortinarius semisanguineus*, *Lactarius rufus*, *Rozites caperata* and *Suillus variegatus*). Plants and fungi growing on K-fertilized plots 17 years after application of the K fertilizer showed significantly lower ^{137}Cs activity concentrations than corresponding species growing in a non-fertilized control area. Thus, ^{137}Cs activity concentration in both plants and fungal sporocarps sampled on K-fertilized area decreased over years but was as an average up to 60% lower compared to ^{137}Cs activity levels in the same species sampled on control area. The reduction of ^{137}Cs activity concentration due to fertilization of forest soil with K was found to be long lasting, statistically significant and strongly pronounced in all species studied. Notable decrease of ^{137}Cs activity concentrations in heather, lingonberry and bilberry was observed already within the first year after K fertilizer application, however, the most pronounced and significant reduction occurred over the first 7-8 years, followed by a gradually decreasing effect. The reduction in ^{137}Cs activity concentration in fungi after K fertilization was less pronounced, but still statistically significant. It has been suggested that single application of K fertilizer to forests might be an effective and feasible long-term countermeasure to decrease radiocaesium accumulation by plants and fungi. The paper will provide new information on long term effect of potassium on caesium uptake by plant and fungi in boreal forest.